WVU Instructional Technology Classroom Configuration Guidelines for Old Analog Systems - February 2012

1. Introduction

The WVU standard instructional technology classroom configurations provide an established minimum requirement for function in any size general-purpose classroom. A standardized multimedia lectern has also been adopted by WVU, with the capability to secure the source, routing, and distribution equipment in their designed locations. WVU requires that these guidelines be followed as designated CTec instructional facilities are renovated or newly installed at WVU, as well as recommends these guidelines for all instructional technology facilities at our various campuses. These guidelines were designed based on issues such as system functionality commonly requested by users, equipment that has a good record of usability, and equipment specifications that set devices apart from similar equipment, stemming from experience with past installations, on-going classroom maintenance, and feedback from WVU faculty, staff, and administration.

These guidelines may change to accommodate future functionality needs and technological equipment evolution at any time without notice. Also, please note that CTec does not provide installation or support services to all WVU departments, but can provide assistance in selecting an appropriate vendor who can provide installation and integration for technology classrooms.

Definition of Terms:

General Contractor – GC

Electrical Contractor – EC

Audiovisual Contractor – Vendor

The following Project Specification details the system needs and must be strictly followed. No deviations will be accepted without written authorization.

2. Project Stipulations

2.1 System Description

This WVU general-purpose classroom facility is to provide for a variety of activities including, but not limited to: large seminars, lectures, symposia, and meetings. The standard technology system needs to include a video projection system, multimedia source devices, signal processing and routing, a media sound reinforcement audio system, an assistive listening system, a touch panel control system, and an interactive pen display. Additional elements may include an integrated media sound and speech reinforcement audio system, auxiliary – gooseneck - wireless lapel and/or wireless handheld(s) microphone systems, dual-projection system with dual-screen PC display, as well as a personal response system. The completed project must include training, equipment/cabling documentation, and an electronic copy of all software code and computer configured equipment.

2.2 Contact Information

Project Client: West Virginia University – Owner, representing the faculty and staff “users”
Project AV Supervisor: WVU-CTec Designee, WVU Classroom Technology (304-293-2832)

Project Manager: WVU-Facilities Management Designee, WVU Facilities (Phone Number)
Room Scheduler: WVU Classroom Scheduling Designee (304-293-0069)
Legal Representative: ?

2.3 Substitutions

No substitutions/deviations will be accepted without prior approval from the Project Manager or AV Supervisor. Requests for substitutions must be in writing and denote reason(s), as well as cost and functionality differences. WVU reserves the right to accept or decline any proposal due to equipment substitutions that do not meet the needs of the Project Client.

2.4 Bidding

A mandatory walk-through will be held (Date and Time TBA) to provide the vendor with an opportunity to visit the facility, address any questions or concerns up to that point, and to obtain room layouts and measurements.

Bids must include a proposed equipment list with itemized costs, proposed wiring diagram, and a substitutions request (if needed). All expected compensations should be itemized. All work performed either by the bidding Vendor or by their Subcontractor must be clearly defined and shall be the responsibility of the Vendor. Any additional detail for support of the bid should be attached at time of submission. Documents must be signed and dated by a principal or officer of the company.

Bid documents must be submitted before (Date and Time TBA) to the Project Manager and AV Supervisor. Bidding Vendors are responsible for contacting the Project Supervisor to make sure bid documents have arrived before the submission deadline.

Costs and functionality changes of deviations are the sole responsibility of the Vendor. Any substitutions made after bid acceptance are considered deviations.

3. Installation Guidelines

Outside of specified timeframes, each classroom being installed must be kept usable for classes. The Vendor shall work in a professional manner, with proper safety measures taken into account at all times. Per state contract, the Audiovisual Vendor will supply labor, equipment, tools, materials, testing, as-built drawings, and follow up support for the audiovisual systems. All Vendor supplied equipment and material for installation will be the responsibility of the Vendor and should arrive with the Vendor on the installation date new, and shipped in factory sealed containers. All shipping charges shall be considered as part of the total proposal. All products will be installed as indicated in these referenced standards unless recommended otherwise by the product manufacturer or specifically indicated otherwise by WVU. The completed project should meet or exceed West Virginia University standards and meet all applicable codes.

3.1 General Installation Requirements

Any electrical outlet, network outlet, or structural work needed for the completion of the project must be coordinated with the Project Manager within two weeks after bid acceptance. Equipment for installation with network connectivity must have its network hardware address (i.e. MAC address) and room installation location provided to Owner at least 2 weeks prior to installation, so that network access, IP addresses, and other installation needs can be made available from Owner by the time Vendor arrives on-site.

All cabling, connectors, and interfaces needed to complete the project requirements must be provided by the vendor. Cables must be clearly labeled with input and output connections and neatly secured using some type of cable management. Rear of all equipment must be accessible for future maintenance. All power cabling shall be routed separately from low-voltage audio, video, and control cabling. Only surge-protected power strips with lighted reset switches shall be used and must be connected directly to floor box power outlets. The Vendor is to install and operationally test all components of the system, including those provided by the Owner, to ensure proper system functionality. Vendor is responsible for the removal and disposal of all packing material and other debris at an “off campus” land fill or recycling center and shall be responsible for repairing any damage caused to the premises by their installation activities, at no cost to the Owner.

3.1.1 “CTec Basic” Installation

Unless otherwise noted, the classroom’s main display shall be a high resolution networkable ceiling mounted LCD projector with a minimum of 3000 ANSI lumens. The projector should send a warning indication to the technician (email is preferred) when maintenance is needed.

In order for the audiovisual signals to reach the projector, the General Contractor will have created space for a plate and a route for cabling, pulled by the Electrical Contractor, from the control box and input panel to the ceiling mounted projector plate. Cat 6 data cable will be run between the control box and the projector plate. Additional cables run to the projector plate shall include at a minimum 15 pin HD male to male VGA with Audio molded connectors, RS-232 control cable, BNC composite video and RCA audio cables. The Vendor shall make the connections for each cable at both ends.

3.1.2 “CTec Standard” Installation

3.1.2.1 Lectern

See section 7.4 for detailed images

An Owner furnished, Vendor installed multimedia lectern will be provided. A “user” accessible side of the lectern will have space to house audio and videos sources (i.e. microphones, PC, etc.). A “technician” accessible side of the lectern will have space inside for Vendor provided rack to house all of the audio/video routing and distribution gear. At least 12 rack spaces will be available for the audio and video routing/distribution equipment to be installed. 3 rack spaces beyond 12 (those located closest to the top of the rack rails) will need to have a rack shelf installed and be left open for a swipe-card lock controller (Owner furnished, Owner installed).

3.1.2.2 Source Components

All “user” accessible components must be located in the multimedia lectern. A Document Camera must be incorporated into the system and mounted to the lectern top. The signal for the projector(s) will be through the VGA output connection and the signal for the video window of the touch panel will be through the composite video output connection. A WVU standard PC computer (Owner furnished, Vendor installed) must be

incorporated into the system and placed inside the “user” side of the lectern. An interactive pen LCD flat panel must display the installed PC computer signal at all times and be securely mounted to the lectern top with a triple-pivot (tilt, swing & rotate) lectern mounted arm. This shall act as the primary monitor for the PC at all times and should be pared with a stylus to enable annotation over computer applications which can be displayed on the projection system and saved to the installed PC. An input panel for connecting portable equipment to the multimedia system must be incorporated into the system for laptop (VGA video cable with male connector, 1/8” stereo audio cable with male connector), RJ45 ethernet cable, XLR auxiliary microphone cable with female connector, as well as composite video RCA jack (stereo audio via dual RCA jacks) shall be part of the system. Input panel plates need to be installed low in the Cable Cubby to allow cables and connectors to easily fit inside with the Cubby door shut.

3.1.2.3 Control

The computer will be controlled with wired keyboard and mouse at the lectern; as well as have connection to an Owner furnished wireless handheld presenter. All other technology must be controllable through an AMX NetLinx control system and 10” or larger tilt-screen touch panel with video window capability (AMX components are Vendor furnished, Vendor Installed, and Vendor programmed). The touch panel will be located at the lectern. In addition to controlling all audiovisual devices and room lighting, the touch panel will show the last source selected/sent to the projector, projector power status, motorized screen status, and the current audio level of sources and mics. In single projector classrooms a single press of the source button sends the signal to the projector, however, in multiple projector rooms a display button corresponding with each projector to allow different sources to be displayed simultaneously. The Vendor must adhere to the campus standard established for the design and layout of touch panels (see Section 5.7.2). The WVU touch panel template can be provided by the Owner and programming shall be in coordination with the Owner. Remote access for reporting and technician control of the AMX system must be provided and configured on Owner’s AMX RMS server to match existing WVU standards.

3.1.2.4 Audio

A stereo audio system (i.e. mixer, amplifier, speakers) shall be incorporated into the audio/visual system, controllable via the AMX touch panel control system, capable of reproducing the projected source(s) audio. These components will be rack mounted in the “technician” access side of the lectern. All classrooms with more than 35 seats shall include a gooseneck microphone and an auxiliary microphone input connection. All classrooms with more than 60 seats shall also include a wireless lapel microphone. All classrooms with more than 100 seats shall incorporate a wireless handheld microphone. And finally, all classrooms with more than 200 seats shall incorporate a second wireless handheld microphone. All microphones must be capable of simultaneous use. All gooseneck microphones will connect at base to lectern-top via XLR jack. Can be detached and be put inside lectern for security. Lectern top location is to be identified on-site by Owner. Wireless mic receivers will be rack mounted.

3.1.2.5 Output Connections

An output panel located on the side of the lectern will duplicate the output(s) shown on the projector(s) and audio heard in the classroom for use with external ADA compliant monitors or video/stereo audio recording devices to help compensate for students with visual or auditory impairments. Connectivity for a personnel assistive listening system with mixed (projected source(s) and all mics) audio shall be installed into the audio/visual system by leaving a 3 foot loop of audio cable with a male XLR connector.

3.1.2.6 Projection

In a typical 8' ceiling classroom, unless otherwise noted, the main display shall be a high resolution networkable ceiling mounted LCD projector with a minimum of 3000 ANSI lumens. The projection screen is to be mounted in the ceiling to display the screen high in the room, for the best viewing angle and largest image size. Therefore the projector is also to be mounted high to the ceiling for the lens to be at the same height as the image top. The screen should also be mounted at least 4 inches from the wall to avoid contacting the chalkboard trey, and at its lowest come no lower than the 3" above the chalkboard trey. The projector should send a warning indication to the technician (email is preferred) when maintenance is needed. In order for the audiovisual signals to reach the projector and for the touch panel to control it, the General Contractor will have created space for a floor box and run conduit for cabling, to be pulled by the Electrical Contractor, from the lectern to the ceiling mounted projector plate. Cat 6 data cable will be run between lectern floor box and each projector plate. Additional cables run between the floorbox at the lectern to the projector plate shall include at a minimum 15 pin HD male to male VGA molded connectors, 9 pin RS-232 control cable, and BNC composite video cable. Low voltage wiring should also be left available for connection on the screen control path to be made to the lectern. The Vendor shall make the connections for each cable at both the floorbox and the projector plate.

3.2 Project Completion

All spare documentation and accessory items shipped with equipment from manufacturers shall be provided to the owner. In addition, for every 2 installed lamps of the same type a spare lamp will be provided by the Vendor. Equipment configuration software/codes, as well as the control system source/configuration codes and any associated files, referenced files, and development software (and all relevant documentation and license) used to compile, develop and build etc. the executable code must be provided to the owner with the final documentation on CD-ROM. The software developer shall retain intellectual property rights; the Owner shall have a license for perpetuity for use as it applies to this project, including the right to modify/enhance. The software code may not be sold or used, in part or in whole, in any other project or application other than that intended by this specification, in part or in whole, by the Owner or any other party.

The vendor must also provide the owner with the following "As Built":

- All equipment manuals, service documentation and warranty information provided on CD-ROM which indexes all documentation that came with the installed equipment
- Wiring diagram of the installed system (detailed drawings indicating equipment wiring, signal flow, layout and orientation) on paper and in electronic format
- Cabling schedule (list containing the cable type, cable marker identifier,

origin/destination location, and connector types for each cable)
- Spreadsheet that lists brand, model, serial number and a functional description for each piece of vendor installed equipment.

Total installation and proof of performance is the responsibility of the Vendor and must be demonstrated to WVU by completion date. The Vendor shall assist the Owner in final system tests and adjustments. The Vendor's representative assisting in the performance of these tests shall be thoroughly familiar with the details of the system and shall include the field supervisor responsible for installing the system. Training on operation and maintenance procedures must be provided to the Project Manager, AV Supervisor and other designated personnel. The Vendor can anticipate providing required training sessions of an average of 1 hour per room after final testing has been completed.

The Vendor shall provide a service contract to WVU for a period of one year that covers the provided hardware, software, and functionality. The contract shall cover repairs of hardware or control system software during WVU business hours. All travel expenses, labor, shipping and parts shall be covered by this service contract. This contract does not supersede any manufacturer warranties and shall not be construed as part of said warranties.

4. Room Type Specifications

WVU uses 3 standardized classroom configurations to fulfill multiple situations and teaching styles in general purpose classrooms. This decision is dependent on the functional requirements, as well as the size of the room, and is decided upon by the Owner project committee. CTec, through user input, trials, and time, have designed configurations that fit multiple situations. This section will serve to define the classroom terminology utilized by WVU. The equipment referenced in this section is laid out in detail in the proceeding section 6.

4.1 "CTec Basic"

"CTec Basic" classrooms are the least complicated technology configuration, and are generally utilized to incorporate technology while still allowing for a more traditional classroom style. This is typically applied to the smallest classrooms, around 35 seats, and places the type of technology used on the instructor. There are two variations on input that may be used to fulfill the needs of the instructor's area connection plate. The preferred style uses a Table Top mounted control unit and separate input panel for outside media. When this style is used a PC is installed and mounted to the instructor station, with no monitor, so it is utilized directly with the projector. The second control and input option uses a wall mounted control box with an integrated input panel. The input panel allows for composite video with stereo audio, and VGA plus Audio inputs with a network jack for internet connectivity. The source input and control are routed through the room to the ceiling mounted projector plate, which is then connected to the projector. The audio for these rooms can be either routed to come directly from the projector speaker, or utilize an enhanced audio system. All of the technology and cabling in this configuration is furnished by the Vendor. Other than cabling, which is pulled through the wall and floor by the Electrical Contractor, the Vendor installs all technology and creates the cabling connections.

4.2 "CTec Standard"

The most widely utilized classroom configuration on the WVU campus is the "CTec Standard" option. Used in any size classroom, it greatly increases the amount of

technology from the “CTec Basic” configuration. The multimedia lectern is used to house all video sources as well as the routing and distribution equipment. Due to the range of situations “CTec Standard” classrooms can fulfill, there are some variations with certain equipment (i.e. audio amplification, projector size and number, etc.). High ceilings, spaced out audiences, and room depth are the influencing factors for equipment changes, and the decision on which equipment will best serve the classroom area will be left for the Project Manager and AV Supervisor to decide.

Technological sources incorporated in this configuration include a PC stored inside the lectern, an interactive pen display monitor attached to an ergonomic arm mounted to the lectern top, document camera mounted to the top of the lectern, and an auxiliary input panel in the top corner of the lectern with XLR, VGA plus Audio, and RCA inputs along with a wired network connection. Room dimensions have an impact on the included voice amplification part of the system as well. Microphones are added as room size expands.

All video and audio sources and classroom aspects (lighting, motorized shades, motorized projection screen) in “CTec Standard” classrooms are controlled though a touch interface placed on the lectern top. Mounted to equipment racks within the lectern are routing and distribution equipment that allows for room function. This includes audiovisual switch, controller, video distribution amplifiers, audio mixer, microphone audio receiver(s), and audio amplifier all of which are furnished and installed by the Vendor.

Also accounted for with the versatility of the “CTec Standard” classroom designs are a variety of viewing options. In spaces allowing for proper sight lines, multiple projectors are installed to allow maximized technology use. This allows different sources to be displayed simultaneously, including the addition of a second standard LCD monitor to allow for “extended desktop” PC source output. Classroom size will also have an effect on the type of projector used to meet the needs of the space.

4.2.1 “CTec Standard Auditorium”

The additional designation of auditorium is placed on a space when the room’s volume is large, ceiling is high, and typically the seating is tiered or sloped. This requires the utilization of the more powerful equipment used in the largest of the “CTec Standard” classrooms. The differences that set the two apart the most are the dimensions of the room and the effect they have on signal strength over the distances they must cover. While smaller auditoriums do not require all of the changes, audio amplification, video signal, and assistive technology must have adequate equipment to meet the room’s needs.

4.2.2 “CTec Standard Computer Lab”

CTec Labs have the added feature of having individual computer workstations for students. Overall, the equipment utilized mirrors that of a “CTec Standard” classroom.

4.3 “CTec Collaborative”

These spaces are the most technologically complex of WVU’s standardized classroom configurations. It incorporates the technology of a “CTec Standard” classroom, centered around a multimedia lectern, but also contains multiple “CTec Basic” stations around the room to be utilized as needed. The “CTec Basic” stations in these cases do have a slight

variation from their use as the center of a classroom space by utilizing short throw projector technology to minimize the impact one station has on the others in the space.

5. Functionality Requirements

In order for WVU classrooms to function as their design intends, the following attributes must be taken into consideration.

5.1 Lectern Type

WVU has designed and chosen 3 lectern styles to meet the needs of each room type. There is a sit down model, a standing model, and a triple cabinet standing model, each of which have a left and right version to meet positioning needs. In rooms with only one entrance, the lectern should be placed at the front of the classroom toward the corner opposite the door. The “left” and “right” designations come from the placement of the “instructor’s” side of the lectern, which should be positioned on the side nearest the wall. Triple cabinet, standing lecterns are reserved for large auditoriums, while the dual cabinet, standing and sit down lecterns serve the majority of the rooms. The decision between the two is generally determined by sight lines necessary for viewing the projected image, with sit downs used in smaller, flat classrooms and stand ups in larger, tiered rooms.

5.2 Floor Box

The standardized floor box for CTec classrooms will allow adequate room for data, power, control, and audiovisual signal disconnects. The main concern in placing the floor box is making sure that, once the lectern’s internal access point is over the box, there is enough room all around the lectern so that it is handicap accessible. The lectern styles are 3 feet deep and this, along with the distance from the “as built” front wall needs to be considered in order to ensure handicap accessibility.

5.3 Assistive Technology

In addition to the output plate located on the lectern for assistive displays, in auditoriums there must also be output panels and power run to floor boxes located at the back of the room for additional displays. This will require the same preparation during construction as the original (a route for cable and the wiring pulled by the Electrical Contractor). These boxes should include sufficient power outlets and Ethernet jacks.

5.4 Projector Type

To ensure image quality, CTec uses different projectors to match the dimensions of each room. For best results, the image height should be at least 1/6 of the distance from the screen to the farthest average seat. Also, it is preferable that the first row of seats be no closer than 2 times the measurement of the screen height. WVU maintains a 35 lumen per square foot ratio. In order to maintain this level of clarity the projector power is increased with the desired size of the image. Since ambient room light has a dramatic effect on image clarity, each installation has to be evaluated with the particular conditions that exist for the room’s natural light and the dimming system.

5.5 Projector Connection Plate

The projector plate used in a “CTec Basic” classroom varies slightly from one used in a “CTec Standard” room. In Basic rooms, both the VGA and Composite video signals must be run paired with the source audio. For a “CTec Standard” room, the projector plate only requires video. For the Composite video plate, a hole cover (included with the plate) will be needed to cover the unused port.

5.6 Projector Mount Type

What is to be considered when determining how to mount the projector(s) in a classroom is how high it must be mounted in order for the image to be projected on the screens. A lift must be installed in rooms where the projector must either be mounted above 11 from the floor below or mounted above seating on a tiered or floor. The mount pole should extend to the top of the screen so the projector lens is lined up with the top of the image when the screen is deployed.

5.7 Audio

In classrooms approaching 100 seats, and tiered auditoriums, audio amplification is upgraded to ensure coverage and clarity. In “CTec Standard” classrooms, microphones are added and increase in amount as room size increases. In classrooms with as few as 35 seats, a gooseneck microphone is mounted to the lectern top and an auxiliary mic input is added to the cabled input panel. At 60 or more seats, a lapel microphone is added. A wireless handheld microphone is added at 100 seats. In the largest classrooms, with 200 or more seats, a second wireless handheld is added.

5.8 Control

5.8.1 AMX

For all CTec Standard based rooms refer to the “Requirements for the AMX Touch Panel Control Interface” document.

5.8.2 Extron

The CTec Basic control panel directly controls the VGA switch and the projector, which comprise the entire technology system for signal routing, audio mixing, and display. The control panel turns the display on and off, with a solid light on the active button. Once the other button is pressed, the previously selected button blinks until the warm up or cool down cycle has completed and the new status is lit. During these cycles the function of the buttons are suspended to prevent the user from locking up the display.

The four buttons labeled for input selection change the source displayed by changing the projector's input signal. Typically, input #1 is VCR, input #2 is Laptop, input #3 is PC, and input #4 is blank.

Volume adjustment of the room sources is done through the controller knob, which is programmed for fine tuning audio control. LED lights above the knob indicate the current level of audio.

6. Equipment Lists by Room Type

The following equipment lists provide the latest CTec configurations being implemented across campus at the time of this documents creation and is meant to serve as a guideline; WVU reserves the right to alter the technology implemented to meet classroom functionality requirements.

6.1 "CTec Basic"

Projection:
- 1 Mitsubishi XL-2550U 4,000 Lumen LCD Projector
- 1 Chief RPA-U Projector Mount
- 1 Chief CMS-445 Ceiling Panel
- 1 Chief CMA-006W 6" Pipe

Projector Plate:
- 1 Extron 60-300-03 AAP102 Frame - White
- 1 Extron 70-108-81 BNC Female to RCA Female AV Plate - White
- 1 Extron 70-161-21 VGA+Audio Plate - White
- 1 Extron 70-102-53 Serial Control with Audio Plate - White
- 1 Extron 70-402-21 RJ45 Plate White

Table Top Version (preferred option):
- 1 Extron 60-818-03 MLC-104 IP Plus MediaLink Controller
- 1 Extron 60-640-02 SMB 102 Surface Mount Box - Black
- 1 Extron Cable Cubby 300S - Black
- 1 Extron 26-490-02 VGA+Audio 6' Cable
- 1 Extron 70-109-73 BNC Female to RCA Female AV Plate – Black

Wall Mount Version:
- 1 Extron 60-818-12 MLC-104 IP Plus AAP MediaLink Controller
- 1 Extron 60-642-02 SMB-104 Surface Mount Box
- 1 Extron 70-109-73 BNC Female to RCA Female AV Plate – Black
- 1 Extron 70-101-73 VGA + Audio AAP Plate – Black
- 1 Extron 70-402-11 RJ-45 AAP Plate – Black
- 1 Extron 70-090-11 Single Blank AAP Plate - Black

Video:
- 1 Extron MLS 102 VGA

Miscellaneous:Power distribution (surge protectors)
- Custom Instructor Station Floorbox Plate

GC Furnished:
- 1 Ceiling Mounted Projection Screen w/ Wall Switch
- 1 Instructor Station Floorbox w/ Network and Power
- 1 Under-Desk Computer Mount

Owner Furnished:
- 1 Instructor Station Table
- 1 Dell Computer – WVU Standard CTec Configuration
- 1 Dell Keyboard
- 1 Dell Mouse
- 1 Targus Wireless Remote Presenter

6.2 "CTec Standard Classroom" (Single Projector Installation)

Projection:
- 1 Mitsubishi XL-2550U 4,000 Lumen LCD Projector
- 1 Chief RPA-U Projector Mount

1 Chief CMS-445 Ceiling Panel
1 Chief CMA-006W 6" Pipe

Projector Panel:
1 Extron 60-300-03 AAP102 Frame - White
1 Extron 70-091-21 Composite Video Plate - White
1 Extron 70-101-21 VGA Plate - White
1 Extron 70-102-22 Serial Control Plate - White
1 Extron 70-402-21 RJ45 Plate - White

Input Panel:
1 Extron Cable Cubby 300S - Black
1 Extron 26-490-03 VGA+Audio 12’ Cable
1 Extron 70-109-73 Aux Video/Audio Input Plate – Black

Output Panel:
1 Extron 60-300-02 AAP 102 Panel Frame - Black
1 Extron 70-101-11 VGA Plate - Black
1 Extron 70-094-12 RCA x3 Aux Video/Audio Output Plate - Black
1 Extron 70-090-12 Blank Plate - Double - Black

Video:
1 SMART Sympodium SSID370
1 Wolfvision VZ-8 Plus3 Document Camera
1 Extron P/2DA2xi 1x2 VGA Distribution Amp
1 Extron MMX 32 VGA A 3x2 Matrix Switcher
1 Extron MDA3V 1x3 Composite Video Distribution Amp

Audio:
1 Biamp Nexia CS Digital Audio Mixer/Processor
1 Crown XLS-202D 2-Ch. Power Amplifier
4 KSI-8081 Ceiling Speaker - No Transformer
1 AKG GN30E 15” Gooseneck Microphone
1 AKG CK80 Hypercardioid Microphone Capsule
1 Telex ClearScan FMR-500 Wireless Lapel Microphone System
1 Electro Voice ClearScan RE2 Wireless Handheld Microphone System
1 Custom Cable w/ XLR for Assistive Listening System

Control:
1 AMX NI3100 Netlinx Processor
1 AMX NXT-CV10 10" Touch Panel
1 AMX PSN6.5 Power Supply
1 AMX FG-3002-18 Asset Management Client License
1 Linksys SD205 5-Port 10/100 Switch

Miscellaneous:
1 Ergotron 45-241-026 LX Desk Mount LCD Single Arm - Black
1 Lowell X2820 Equipment Rack
1 Middle Atlantic U2 Rack Shelf
Power Distribution (surge protectors)
Custom Floorbox Plate

GC Furnished & Installed:
1 Ceiling Mounted Projection Screen w/ Wall Switch
1 Projection Screen Low Voltage Control Interface
1 Preset Programmable Zoned Lighting System
1 Lighting System Control Interface - RS-232
1 Instructor Station Floorbox w/ Network and Power
4 KSI-8081 Ceiling Speaker - No Transformer

Owner Furnished:
1 WVU Standard CTec Lectern
1 Dell Computer – WVU Standard CTec Configuration
1 Dell Keyboard
1 Dell Mouse

1 Targus Wireless Remote Presenter

6.3 "CTec Standard Auditorium" (Dual Projector System Installation)

Projection:
- 2 EIKI LC-X800 12,000 Lumen XGA LCD Projector, No Lens
- 2 EIKI 945-044-0978 Standard 2.05-2.65:1 zoom Lens
- 2 Chief VCM Projector Mount
- 2 Chief CMA-100 8" Ceiling Plate with Adjustable 1.5" NPT Column

Projector Panel:
- 2 Extron 60-300-03 AAP102 Frame - White
- 2 Extron 70-091-21 Blank Plate - White
- 2 Extron 70-101-21 VGA Plate - White
- 2 Extron 70-102-22 Serial Control Plate - White
- 2 Extron 70-402-21 RJ45 Plate - White

Lectern Panel:
- 1 Extron Cable Cubby 300S – Black
- 1 Extron 26-490-03 VGA+Audio 12' Cable
- 1 Extron 70-109-73 Aux Video/Audio Input Plate – Black

Output Panel:
- 1 Extron 60-300-02 AAP 102 Panel Frame – Black
- 2 Extron 70-101-11 VGA Plate – Black
- 1 Extron 70-090-11 Single Blank AAP Plate - Black
- 1 Extron 70-093-71 RCAx2 Audio Output Plate – Black

Video:
- 1 SMART Sympodium SSID370
- 1 Wolfvision VZ-8 Plus3 Document Camera
- 1 Extron MVX 88 VGA A 8x8 VGA+Audio Matrix Switch
- 2 Extron DVS-304 DVI Scaler
- 4 Extron MTP T 15HD RS Twisted Pair Transmitter
- 4 Extron MTP RL 15HD RS Twisted Pair Receiver
- 2 Extron MTP DA4 1X4 Twisted Pair Distribution Amp
- 1 Extron MDA 3V Composite Video Distribution Amp

Assistive Technology
- 2 Samsung 400FP-3 Professional Large LCD Monitor
- 2 Custom Large LCD Security Mount
- 2 Display Devices CMC-5000 Professional LCD Monitor Cart
- 1 Listen LT-800 FM Transmitter
- 1 Listen LA-326 Rack Mount Bracket
- 4 Listen LR-500 Receiver
- 4 Listen LA-164 Single Ear Speaker
- 1 Listen LA-122 Coax Dipole/Monopole Antenna Kit
- 1 Listen LA-304 ADA Compliance Signage Kit

Audio:
- 2 Biamp Nexia CS Digital Audio Mixer/Processor
- 1 Crown CDi-1000 2 Ch 70V Power Amplifier
- 1 AKG GN30E 15" Gooseneck Microphone
- 1 AKG CK80 Hypercardioid Microphone Capsule
- 1 Telex ClearScan FMR-500 Wireless Lapel Microphone System
- 2 Electro Voice ClearScan RE2 Wireless Handheld Microphone System
- 1 Custom Cable w/ XLR for Assistive Listening System

Control:
- 1 AMX NI4100 Netlinx Processor

1 AMX NXT-CV10 10" Touch Panel
1 AMX PSN6.5 Power Supply
1 AMX FG-3002-18 Asset Management Client License
1 Linksys SD205 5-Port 10/100 Switch

Miscellaneous:
1 Ergotron 45-245-026 Dual LCD Mounting Arm - Black
2 Lowell X2820 Equipment Rack
1 Middle Atlantic U2 Rack Shelf
Power distribution (surge protectors)
Custom Floorbox Plate

GC Furnished & Installed:
2 Projector Lifts
2 Ceiling Mounted Projection Screen w/ Wall Switches
2 Projection Screen Low Voltage Control Interfaces
1 Preset Programmable Zoned Lighting System
1 Lighting System Control Interface - RS-232
1-2 Instructor Station Floorbox w/ Network and Power
1-3 Student Station Floorbox w/ Network and Power
8 KSI-8081 Ceiling Speakers with PZ90WJ Transformer

Owner Furnished:
1 WVU Standard Triple Cabinet CTec Lectern
1 Dell Computer – WVU Standard CTec Configuration
1 Dell Flatpanel VGA Monitor – WVU Standard
1 Dell Keyboard
1 Dell Mouse
1 Targus Wireless Remote Presenter

6.4 "CTec Computer Lab"

Student Computers provided, installed, and supported by group other than CTec.

For "CTec Basic" style Ref. Section 5.1
For "CTec Standard" style Ref. Section 5.2

6.5 "CTec Collaborative"

6.5.1 Main System:

Projection:
1 Mitsubishi WD-620 4,000 Lumen 1280x800 Projector
1 Chief RPA-U Projector Mount
1 Chief CMA-455 Ceiling Panel
1 Chief CMA-006W 6" Pipe

Projector Panel:
1 Extron 60-300-03 AAP102 Frame – White
1 Extron 70-091-21 Video Plate – White
1 Extron 70-101-21 VGA Plate – White
1 Extron 70-102-22 Serial Control Plate – White
1 Extron-402-21 RJ45 Plate – White

Input Panel:
1 Extron Cable Cubby 300S – Black
1 Extron 26-490-03 VGA + Audio 12' Cable
1 Extron 70-109-73 Aux Video/Audio Input Plate – Black

Output Panel:
- 1 Extron 60-300-02 AAP 102 Panel Frame – Black
- 1 Extron 70-101-11 VGA Plate - Black
- 1 Extron 70-094-12 RCA x 3 Auxiliary Audiovisual Output Plate - Black
- 1 Extron 70-090-12 Blank Plate – Double – Black
- 1 Cable with XLR for Assistive Listening System

Video:
- 1 SMART Sympodium ID422w 22” Widescreen Sympodium
- 1 Wolfvision VZ-8 Plus3 Document Camera
- 1 Extron P/2DA2xi 1x2 VGA Distribution Amplifier
- 1 Extron MAV 44AV 4x4 Video/Stereo Audio Matrix Switcher
- 1 Extron Crosspoint Ultra 84HVA 8x4 RGBHV + Audio Matrix Switcher

Audio:
- 1 Biamp Nexia CS Digital Audio Mixer/Processor
- 1 Crown 280A 2x80W 70 Volt Power Amplifier
- 1 AKG GN30E 15” Gooseneck Microphone
- 1 AKG CK80 Hypercrdoid Microphone Capsule
- 1 Telex ClearScan FMR-500 Wireless Lapel Microphone System
- 1 Electro Voice ClearScan RE2 Wireless Handheld Microphone System
- 8 KSI-8081 Ceiling Speakers with PZ90WJ Transformer

Control:
- 1 AMX NI3100 Netlinx Processor
- 1 AMX NXT-CV10 10” Touch Panel
- 1 PSN6.5 Power Supply
- 1 AMX FG-3002-18 Asset Management Client License
- 1 Linksys SD205 5-Port 10/100 Switch

Miscellaneous:
- 1 Ergotron 45-241-026 LX Desk Mount LCD Single Arm - Black
- 1 Lowell X2820 Equipment Rack
- 1 Middle Atlantic U2 Rack Shelf
- Power Distribution (surge protectors)
- Custom Floorbox Plate

GC Furnished & Installed:
- 1 Ceiling Mounted Projection Screen w/ Wall Switch
- 1 Projection Screen Low Voltage Control Interface
- 1 Preset Programmable Zoned Lighting System
- 1 Lighting System Control Interface - RS-232
- 1-2 Instructor Station Floorbox w/ Network and Power
- 8 KSI-8081 Ceiling Speakers with PZ90WJ Transformer

Owner Furnished:
- 1 WVU Standard CTec Lectern
- 1 Dell Computer – WVU Standard CTec Configuration
- 1 Dell Keyboard
- 1 Dell Mouse
- 1 Targus Wireless Remote Presenter

6.5.2 Student Station (for each installed):

Projection:
- 1 SMART SBD685ix Dual Touch 87” Widescreen SMART Board with UX60 2,000 Lumen 1280 x 800 Projector

Input Panel:
- 1 Extron 60-640-02 SMB-102 Surface Mount Box
- 1 Extron 70-414-11 RJ-45 Female to Punch Down for Cat 6 – Black
- 1 Extron 70-586-12 USB B Female to USB A Female on 10” Pigtail – Black
- 1 Extron 70-109-73 Aux Video/Audio Input Plate – Black
- 1 Extron 70-101-73 VGA + Audio Engraved AAP Plate – Black

1 Extron 26-490-03 VGA+Audio 6’ Cable
Miscellaneous:
Custom 6’ Cable Bundle

7. **Images**

7.1 Output Panel Plates

7.1.1 Single Projection Classroom System Plate

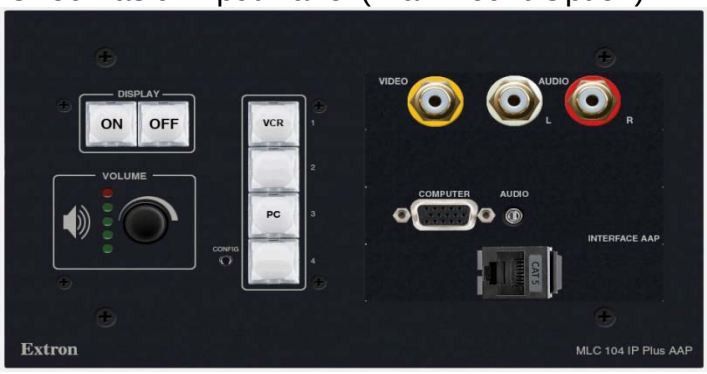
7.1.2 Dual Projection Auditorium System Plate

7.2 Input Panels

7.2.1 Cable Cubby

Note: Inclusion of the XLR cable dependant on room size.

7.2.2 "CTec Basic" Input Panel (Wall Mount Option)



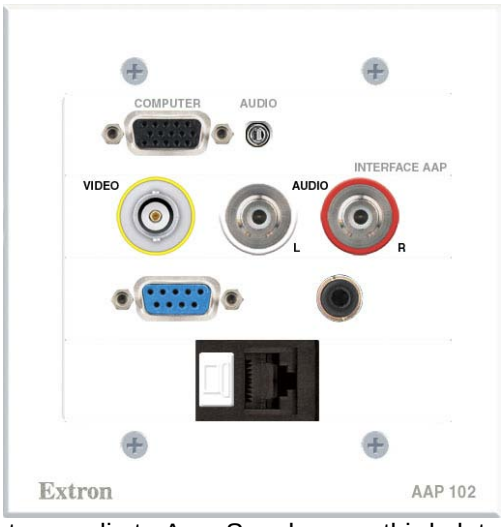
7.2.3 CTec Collaborative Student Input Panel

7.3 Projector Panels

7.3.1 “CTec Standard”

Note: White circle represents the hole plug accessory needed to fill the unused plate opening.

7.3.2 “CTec Basic”



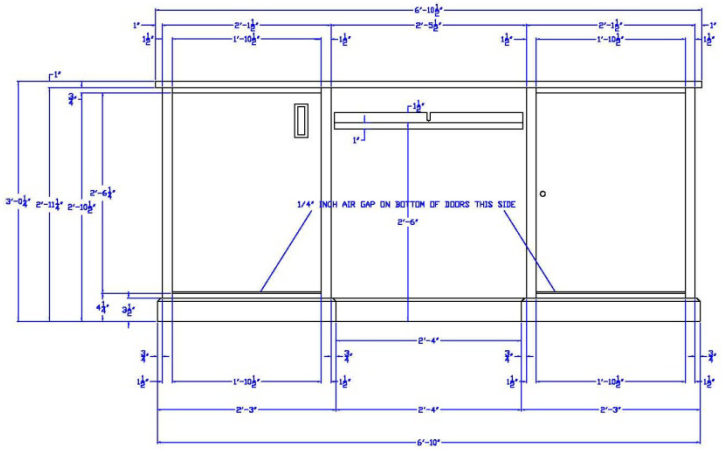
Note: Return audio to Amp Speakers on third plate.

7.4 Lectern Styles

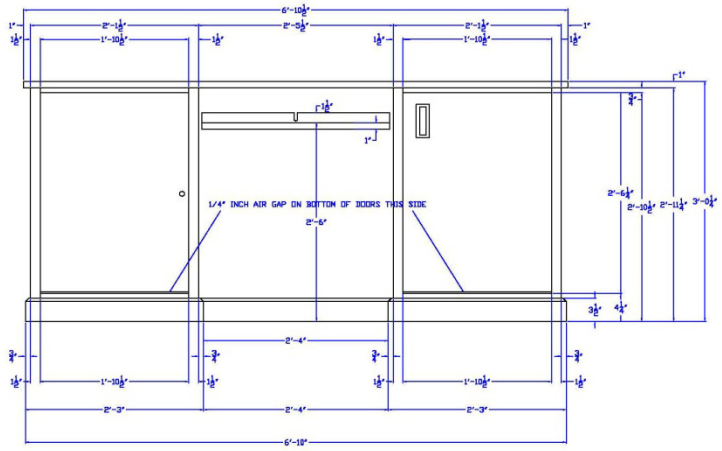
These lectern styles are the sole intellectual property of West Virginia University

7.4.1 Double Cabinet, Seated Lecterns

7.4.1.1 Seated Left

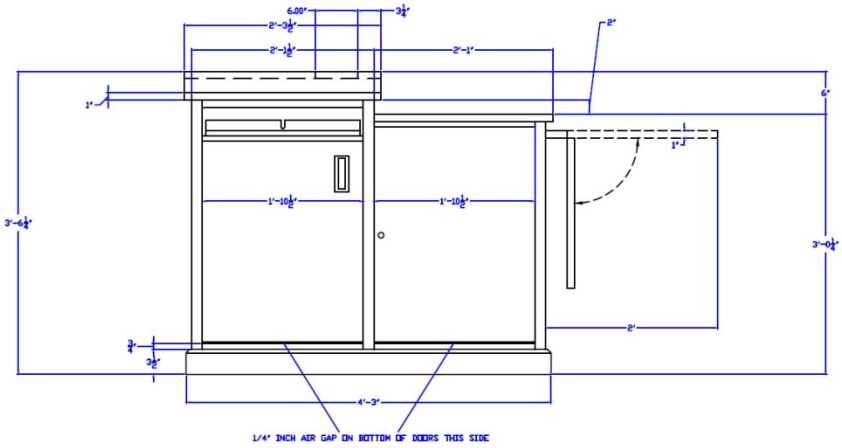


7.4.1.2 Seated Right

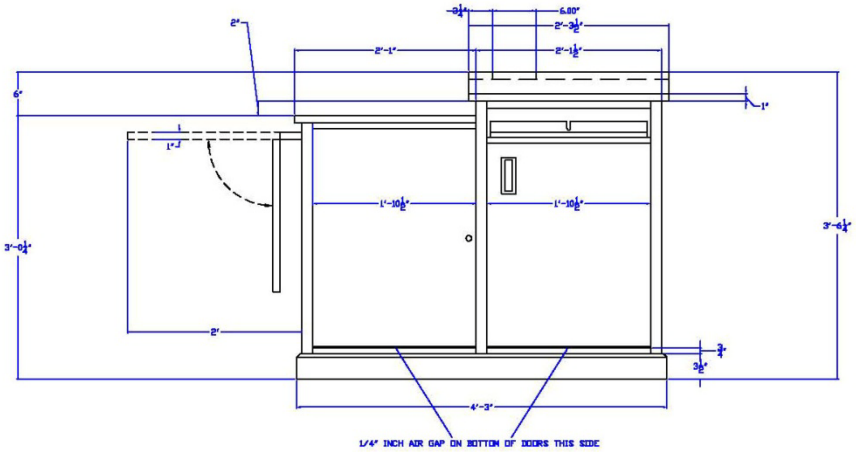


7.4.2 Double Cabinet, Standing Lecterns

7.4.2.1 Standing Left



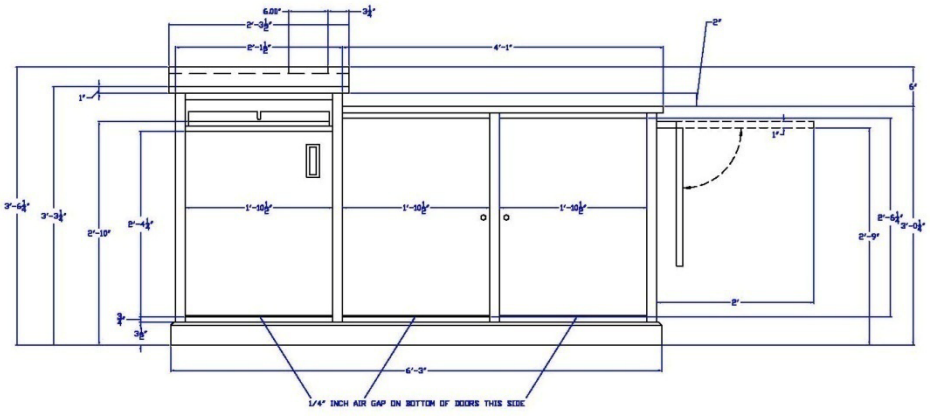
7.4.2.2 Standing Right



7.4.3 Triple Cabinet, Standing Lectern

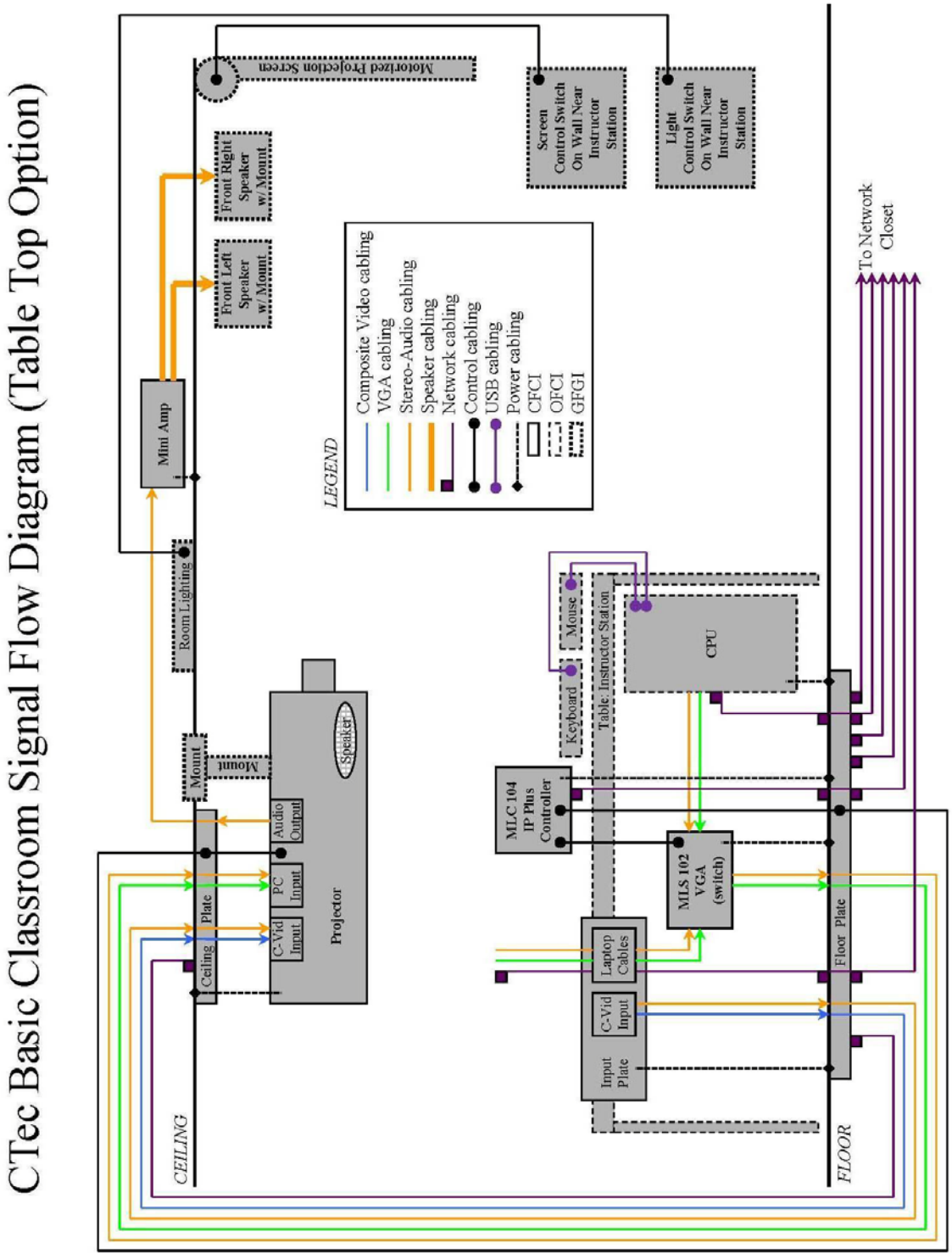
7.4.3.1 Standing Left

.

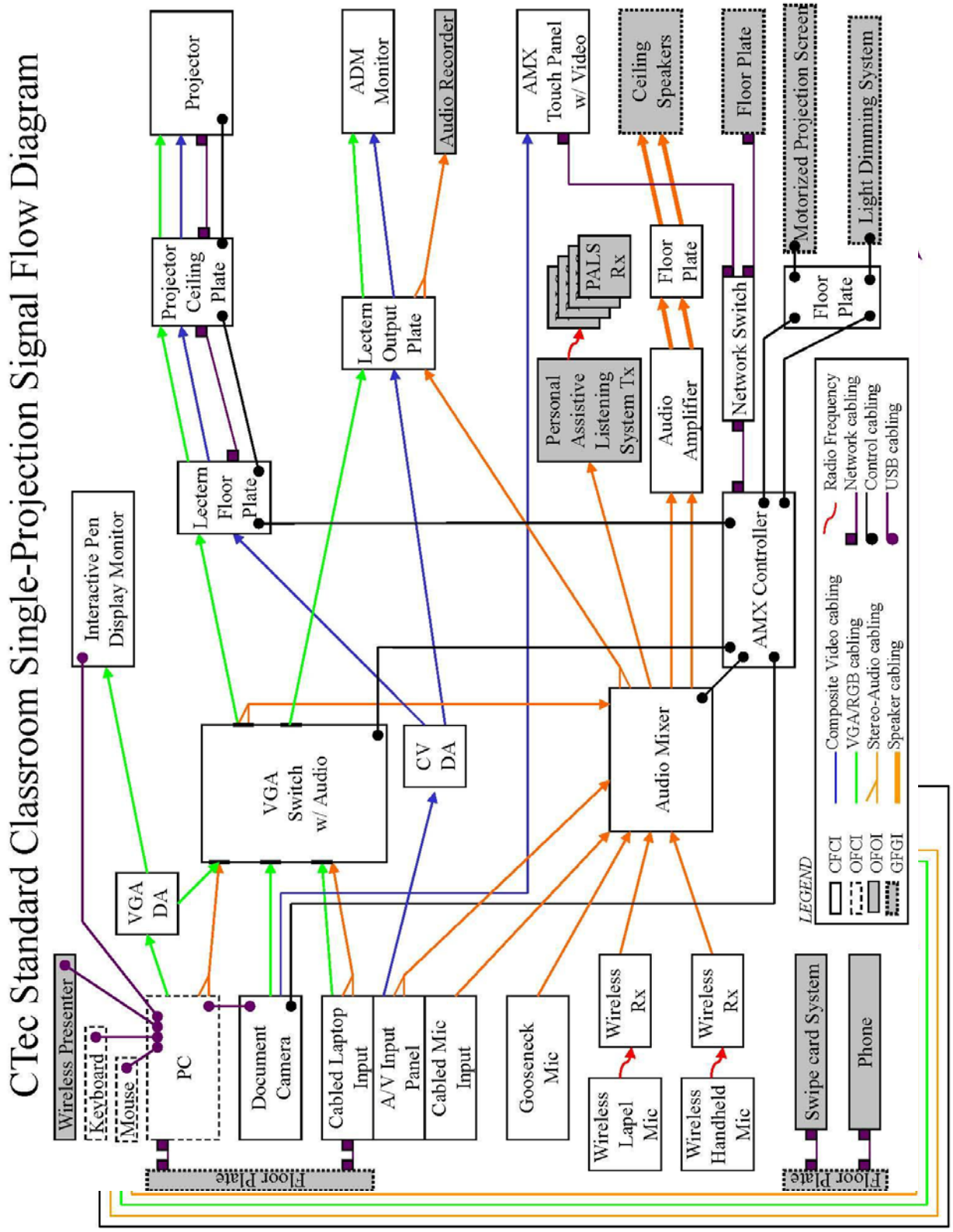


8. Wiring Diagrams

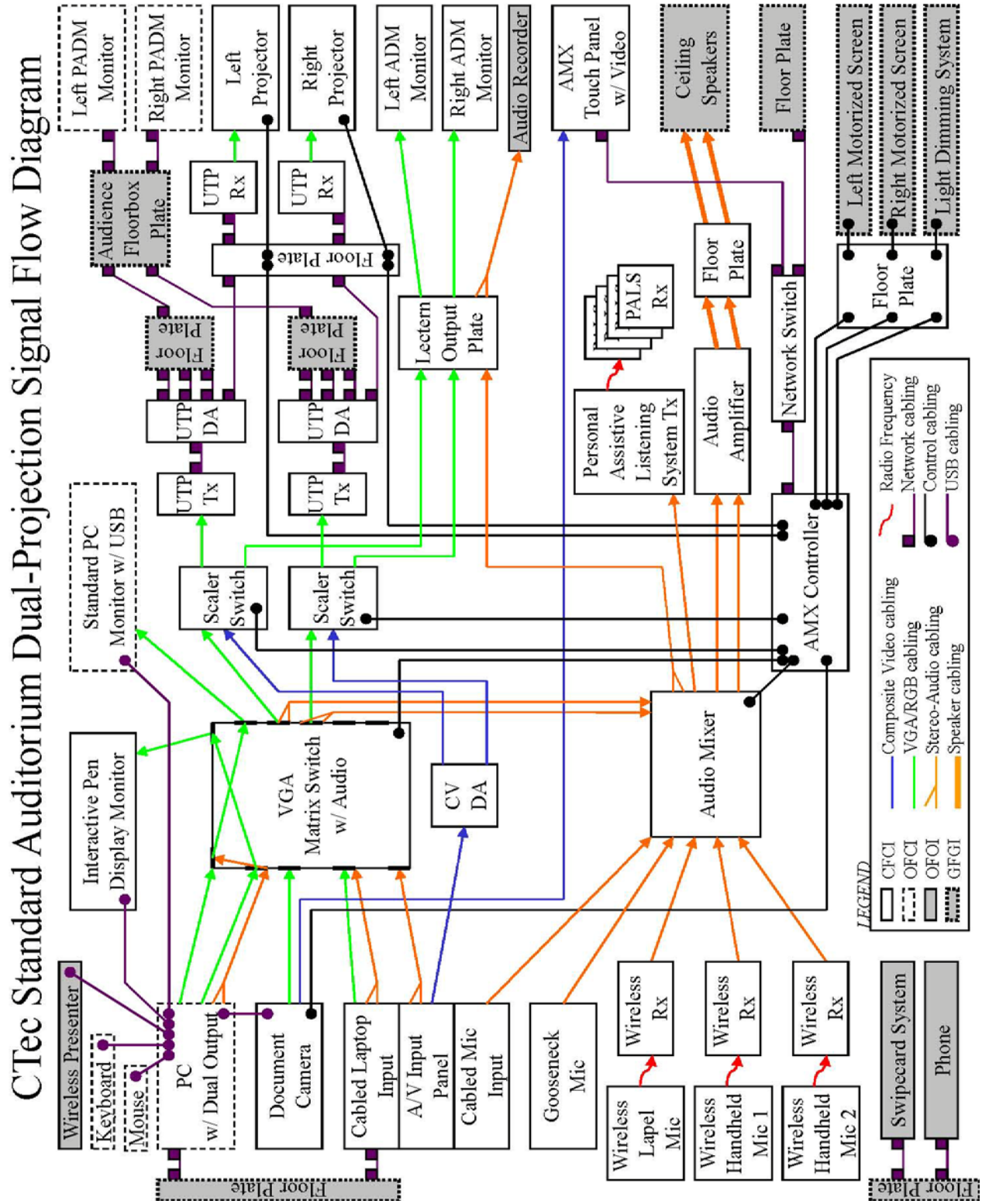
8.1



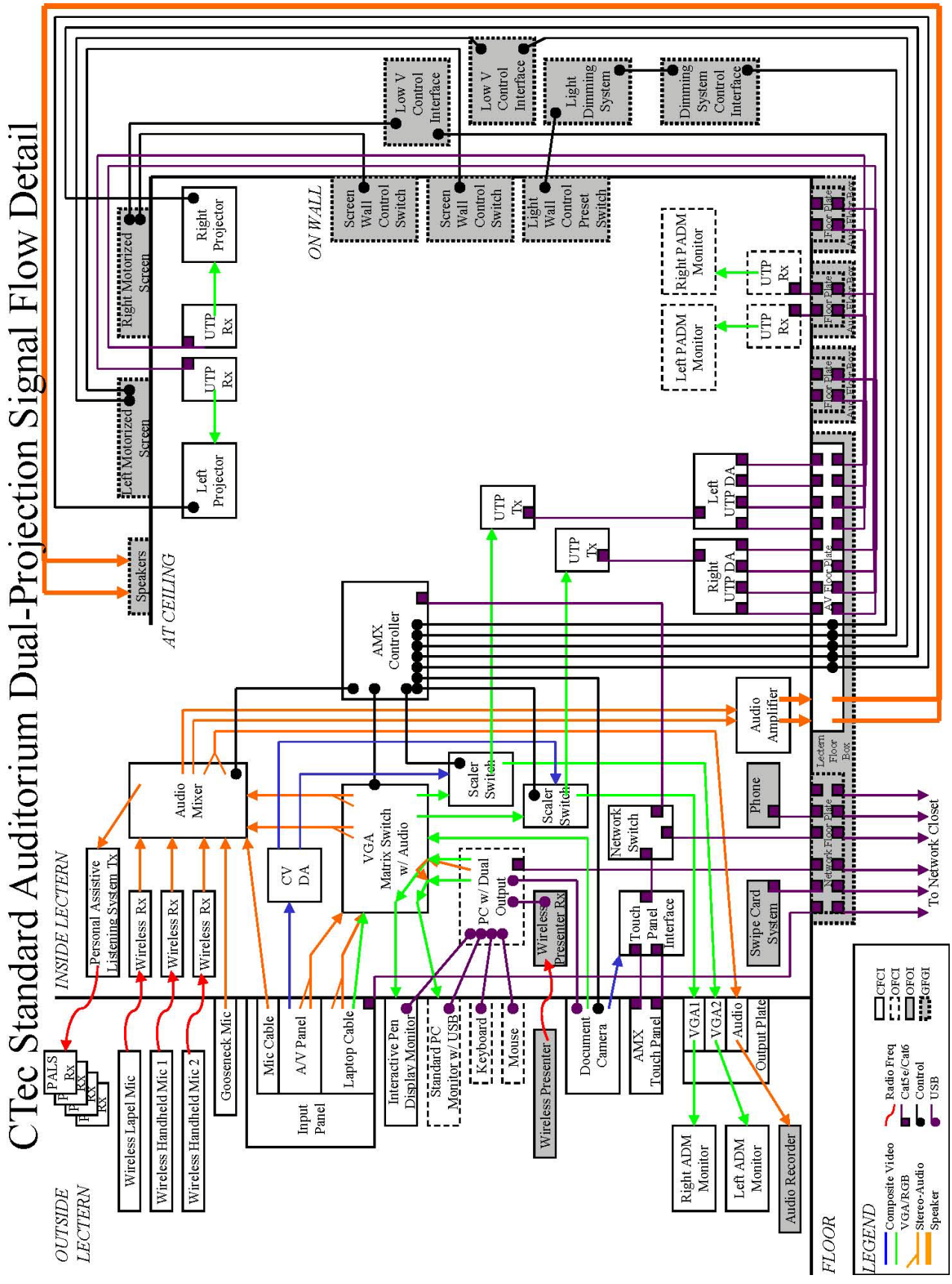
8.2


CTec Standard Classroom Single-Projection Signal Flow Diagram
Wireless Presenter
Keyboard
Mouse
PC
Floor Plate
Document Camera
Cabled Laptop Input
A/V Input Panel
Cabled Mic Input
Floor Plate
Gooseneck Mic
Wireless Lapel Mic
Wireless Rx
Wireless Handheld Mic
Wireless Rx
Swipe card System
Floor Plate
Phone
VGA DA
Interactive Pen Display Monitor
VGA Switch w/ Audio
CV DA
Audio Mixer
AMX Controller
Lectern Floor Plate
Projector Ceiling Plate
Projector
Lectern Output Plate
ADM Monitor
Audio Recorder
Personal Assistive Listening System Tx
PALS Rx
AMX Touch Panel w/ Video
Audio Amplifier
Floor Plate
Ceiling Speakers
Network Switch
Floor Plate
Motorized Projection Screen
Floor Plate
Light Dimming System
LEGEND
CFCI
OFCI
OFOI
GFGI
Composite Video cabling
VGA/RGB cabling
Stereo-Audio cabling
Speaker cabling
Radio Frequency
Network cabling
Control cabling
USB cabling

8.3


CTec Standard Auditorium Dual-Projection Signal Flow Diagram
Left PADM Monitor
Right PADM Monitor
Left Projector
Right Projector
Left ADM Monitor
Right ADM Monitor
Audio Recorder
AMX Touch Panel w/ Video
Ceiling Speakers
Floor Plate
Left Motorized Screen
Right Motorized Screen
Light Dimming System
Audience Floorbox Plate
UTP Rx
UTP Rx
Floor Plate
Floor Plate
Floor Plate
UTP DA
UTP DA
UTP Tx
UTP Tx
Lectern Output Plate
PALS Rx
Personal Assistive Listening System Tx
Audio Amplifier
Floor Plate
Network Switch
Floor Plate
Standard PC Monitor w/ USB
Scaler Switch
Scaler Switch
AMX Controller
Interactive Pen Display Monitor
VGA Matrix Switch w/ Audio
CV DA
Audio Mixer
Wireless Presenter
Keyboard
Mouse
PC w/ Dual Output
Document Camera
Cabled Laptop Input
A/V Input Panel
Cabled Mic Input
Gooseneck Mic
Wireless Rx
Wireless Rx
Wireless Rx
Wireless Lapel Mic
Wireless Handheld Mic 1
Wireless Handheld Mic 2
Swipecard System
Phone
Floor Plate
Floor Plate
LEGEND
CFCI
OFCI
OFOI
GFGI
Composite Video cabling
VGA/RGB cabling
Stereo-Audio cabling
Speaker cabling
Radio Frequency
Network cabling
Control cabling
USB cabling

8.4


CTec Standard Auditorium Dual-Projection Signal Flow Detail
INSIDE LECTERN
OUTSIDE LECTERN
AT CEILING
ON WALL
FLOOR
Personal Assistive Listening System Tx
PALS Rx
Wireless Rx
Wireless Lapel Mic
Wireless Handheld Mic 1
Wireless Handheld Mic 2
Gooseneck Mic
Audio Mixer
CV DA
Mic Cable
A/V Panel
Laptop Cable
Input Panel
VGA Matrix Switch w/ Audio
Interactive Pen Display Monitor
Standard PC Monitor w/ USB
Keyboard
Mouse
PC w/ Dual Output
Wireless Presenter Rx
Wireless Presenter
Scaler Switch
Scaler Switch
Document Camera
Network Switch
Touch Panel Interface
AMX Touch Panel
AMX Controller
Speakers
Left Motorized Screen
Right Motorized Screen
Left Projector
Right Projector
UTP Rx
UTP Rx
UTP Tx
UTP Tx
Screen Wall Control Switch
Screen Wall Control Switch
Light Wall Control Preset Switch
Low V Control Interface
Low V Control Interface
Light Dimming System
Dimming System Control Interface
Left PADM Monitor
Right PADM Monitor
UTP Rx
UTP Rx
Left UTP DA
Right UTP DA
AV Floor Plate
Network Floor Plate
Lectern Floor Box
Audio Amplifier
Phone
Swipe Card System
To Network Closet
VGA1
VGA2
Audio
Output Plate
Right ADM Monitor
Left ADM Monitor
Audio Recorder
LEGEND
Composite Video
VGA/RGB
Stereo-Audio
Speaker
Radio Freq
Cat5e/Cat6
Control
USB
CFCI
OFCI
OFOI
GFGI